REMARKS/ARGUMENTS

The arguments and amendments presented herein incorporate the arguments and amendments Applicants discussed with the Examiner during the phone interviews on October 3, 2007. Applicants submit that the arguments and amendments presented herein make the substance of the phone interview of record to comply with 37 CFR 1.133. The Examiner requested Applicants to make the amendments discussed during the phone interview to advance prosecution. The Examiner said the discussed amendments may overcome the cited art and that the Examiner would reconsider the rejections in view of the amendments and arguments. If the Examiner believes that further information on the interview needs to be made of record to comply with the requirements, Applicants request the Examiner to identify such further information.

Applicants canceled claims 3, 13, and 23. The Examiner had rejected claim 3 as indefinite (35 U.S.C. §112, par. 2), which rejection is overcome by cancelling the rejected claim.

Applicants amended claims 1, 2, 7, 8, 10, 12, 21, and 22 to change include the "storage resource manager" language, and in certain claims replace "monitor program" with "storage resource manager".

Applicant amended claim 30 to clarify that the "operations further comprise".

1. Claims 1-30 are Patentable Over the Cited Art

The Examiner rejected claims 1-30 as anticipated by Arakawa (U.S. Patent Pub. No. 2003/0204597). Applicants traverse with respect to the amended claims.

Amended independent claims 1, 11, and 21 concern providing information on a network storage system, and require: receiving, by a storage resource manager, information from at least one host system identifying storage units the host systems access through at least one identified storage system; probing, by the storage resource manager, the at least one storage system to determine storage units available through the storage system and an identifier of the storage system, wherein the storage system manages access to the storage units and maintains information on the managed storage units; and processing, by the storage resource manager, the information received from the host systems on storage units the host systems access and the information probed from the at least one storage system on the storage units available through

the storage system to determine an association of host systems to storage units for the at least one storage system.

Claim 11 does not use the term "storage resource manager" but recites that the operations are performed by code in a system in communication with at least one host system and storage system over a network.

Applicants amended claims 1 and 21 to recite that the operations are performed by a storage resource manager, separate from the host system and storage system from which the information is gathered. Claims 1, 11, and 21 were amended to recite that the storage system manages access to the storage units and maintains information on the manages storage units. These added requirements are disclosed on at least paras. 7, 8, 11, and 16 and FIGs. 6, 7, and 8 of the Specification.

The Examiner cited paras. 48-50 of Arakawa as disclosing the pre-amended claim requirement of probing the at least one storage system (Office Action, pg. 3), which now recites probing, by the storage resource manager or a system (for claim 11), the at least one storage system to determine storage units available through the storage system and an identifier of the storage system, wherein the storage system manages access to the storage units and maintains information on the managed storage units. Applicants traverse with respect to the amended claims.

The cited paras. 48-50 describe how a storage subsystem includes a control unit that provides a server and host with logical volumes by associating the logical volume accessed by the server or the host with a storage area of a disk unit. The logical volumes are associated with virtual volumes. The control unit holds address conversion information required for address conversion processing to permit an external device to treat the storage areas of the disk units as one of a plurality of logical volumes.

The cited Arakawa discusses how a control unit maintains information on how logical volumes are associated with the disk units. However, there is no disclosure or mention in the cited paras. 48-50 of a storage resource manager (or system as with claim 11) separate from the storage system that probes the storage system to determine available storage units. Instead, the cited Arakawa discusses how a storage subsystem maintains information on the assignment of storage to logical volumes, not how a storage resource manager (or system for claim 11) probes the storage subsystem to determine information on the storage units available at the storage

system and an identifier of the storage system. In fact, the cited storage subsystem would have no need to perform the claimed probing operation to determine the information it already has.

The Examiner cited FIG. 5, blocks 1011 and 1012 as disclosing the pre-amended claim requirement of processing the information (Office Action, pg. 3), which now recites processing, by the storage resource manager, the information received from the host systems on storage units the host systems access and the information probed from the at least one storage system on the storage units available through the storage system to determine an association of host systems to storage units for the at least one storage system.

The cited FIG. 5 discusses how a host 300 requests additional storage space from a server 200, and the server searches a repository 210 to find a storage area of a logical volume 500 which is not used. If storage space is found, the server 200 creates a virtual volume requested by the host using the located storage area at cited step 1011 and assigns the virtual volume to the host at cited step 1012. (Arakawa, para. 122)

The cited FIG. 5 discusses how a server creates a virtual volume for a host from available space in a logical volume maintained by a storage subsystem. Nowhere does this cited FIG. 5 anywhere disclose or mention the claim requirement that a storage resource manager processes information received separately from hosts on storage units the hosts systems access and information probed from a storage system on storage units to determine an association of host systems to storage units for a storage system. Instead, the cited FIG. 5 discusses how a server 200 determines from an internal repository 210 (see FIG. 2) available storage space in a logical volume to assign to a virtual volume. The server 200 would not need to determine from the hosts the storage units the host can access because in the cited FIG. 5 the server is assigning a virtual volume to the hosts from available storage space.

Applicants note that para. 115 of Arakawa mentions that the server obtains information from the storage subsystem 100 and stores in the repository 210. Para. 116 mentions that the server 200 obtains information about a host bus adaptor of the host, host port and a virtual volume from the host and registers that information in the repository 210. The server further analyzes the topology of the devices. Para. 117 mentions that the server 200 obtains from an agent of the host information about a virtual volume 600 used by application software in the host.

Although paras. 115-117 of Arakawa mentions that the server obtains information from the hosts and server, Applicants submit that the cited Arakawa does not discloses processing information from the hosts on storage units the host may access and information probed from the storage system on the storage units available to associate host systems to storage units for the at least one storage system. Instead, paras. 115-117 discuss gathering information in the repository, but not making the association as claimed.

Applicants amended claims 1, 11, and 21 to include aspects of canceled claims 3, 13, and 23 in that the storage resource manager (or code for claim 11) performs the operations of obtaining, probing and receiving, information from the hosts and storage systems and processing this information to associate host systems to storage units. The Examiner cited para. 133 Arakawa with respect to canceled claims 3, 13, and 23.

The cited para. 133 mentions that a snapshot of the data is made if the destination is in a remote location, i.e., the destination is different than the source, in order to initiate the backup operation (step 1102). The snapshot function ensures that the data that have been backed-up are consistent with the source data. The server 200 identifies the timing of the snapshot creation by obtaining information about processing of the application software 310 and the OS 320 from the agent 340 executed by the host 300, and by executing the agent 340 and the access processing software 330 to control an access request from the application software 310 and the OS 320, and an access from the host 300 to the virtual volume 600.

Although the cited para. 133 discusses how the server 200 performs a point-in-time backup operation, nowhere does this disclose that a single component, such as the claimed storage resource manager, receive information from at least one host on storage units the host systems access, probe a storage system to determine storage units, and then process this information to associate host system to storage units for the storage system. Instead, the cited para. 133 discusses how the server performs a backup operation comprising a snapshot copy.

Accordingly, amended claims 1, 11, and 21 are patentable over the cited art because the additional requirements of these claims are not disclosed in the cited Arakawa.

Claims 2, 4-10, 12, 14-20, 22, and 24-30 are patentable over the cited art because they depend from one of amended claims 1, 11, and 21, which are patentable over the cited art for the reasons discussed above.

Claims 8, 18, and 28 depend from claims 7, 17, and 27, respectively, and further require maintaining host/storage unit assignment information indicating for one storage system the storage units available through that storage system and the host systems that access the available storage units, wherein the host/storage unit assignment information is generated by processing the host system and storage system information in the data repository.

The Examiner cited paras. 127 and 117 of Arakawa as disclosing the additional requirements of these claims. (Office Action, pg. 5). Applicants traverse.

The cited para. 127 mentions a table associating information on virtual volumes with the logical volumes and physical storage units. A column 56 provides virtual volume numbers; a column 58 provides the size of virtual volume; a column 60 provides storage subsystem numbers; a column 62 provides logical volume numbers; a column 64 provides storage area addresses; and a column 66 provides the size of storage area.

Although the cited para. 127 discusses associating virtual volumes, logical volumes, and physical volumes, this does not disclose the claim requirement of indicating for one storage system the storage units available and the host systems that access the available storage units, where this information is generated by processing information separately gathered from the host system and storage system.

The cited para. 117 mentions that the server 200 detects a change in configuration of the devices, which are connected to the SAN 900, a change in topology, etc., and then updates the information stored in the repository 210 to hold new information. The server 200 also obtains, from the agent 340 of the host 300, information about the virtual volume 600 used by the application software 310, an area of the virtual volume 600, a tendency of use, performance, and the like, and then records the information as host information in the repository 210 together with the above-mentioned information.

Although the cited para. 117 discusses how the server gathers information from the hosts and storage subsystem to store in the repository, this does not disclose the claim requirement of indicating for one storage system the storage units available and the host systems that access the available storage units, where this information is generated by processing information separately gathered from the host system and storage system.

Accordingly, claims 8, 18, and 28 provide additional grounds of patentability over the cited art because the additional requirements of these claims are not disclosed in the cited Arakawa.

Conclusion

For all the above reasons, Applicant submits that the pending claims 1, 2, 4-12, 14-22, and 24-30 are patentable. Should any additional fees be required beyond those paid, please charge Deposit Account No. 09-0466.

The attorney of record invites the Examiner to contact him at (310) 553-7977 if the Examiner believes such contact would advance the prosecution of the case.

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